The Maudsley adult Autism and ADHD clinics: two disorders, one national service

Dr Susannah Whitwell
Clinical Lead
Adult ADHD service
• The two Maudsley clinics
• ADHD and ASD comorbidity
• The links between ADHD and ASD
• Comorbid ADHD and ASD presentation
• Assessment
• Treatment
• Case study Mr A
Benefits to specialist ND services

- Significant comorbidity
- ASD and ADHD face similar problems at transition
- Both are likely underdiagnosed
- Both need lifespan approach
- Lack of capacity in adult psychiatric services or primary care
- Pooling of academic and clinical expertise
- Focus on non-ID ND populations
- Aligned to research priorities, DSM-5 conceptualisation
National/regional tertiary service

- Centres of excellence
- Leaders in research and setting standards of service
- Expertise as a result of dedicated clinicians with significant experience

but
- Geographically distant, with limited local knowledge
- Long-term follow-up not practical for many patients
- Difficult for some patients to access
- May attract an atypical client group because of the distances involved and the additional difficulties associated with obtaining funding for tertiary services
ADHD

• Neurodevelopmental disorder
• 2-5% children in the UK
• 15-50% continue to have problems in adulthood
• 1% prevalence in adults: (Kooij et al 2001)
• Diagnostic challenge
• likely under diagnosis in adulthood
ADHD DSM 5 diagnosis

• Criteria A: 5+ inattentive and/or hyperactive/impulsive symptoms in adulthood
• Criteria B: several symptoms by age 12
• Criteria C: present in 2 or more settings
• Criteria D: impairment
• Criteria E: not better explained by another disorder
ADHD and ASD comorbidity

- ICD-10: a diagnosis of hyperkinetic disorder is not made if it occurs exclusively during the course of ASD
- Based on the assumption of diagnostic hierarchy
- This has tended to downplay significance of ADHD symptoms in this population
- Previous diagnostic exclusionary criteria in DSM-IV prohibited a dual diagnosis, although this has been amended in DSM 5
How frequently do they co-occur?

ADHD in ASD:
• Studies of people with ASD using structured psychiatric interviews with parents report that 28-30% meet symptom criteria for ADHD (Simonoff, 2008; Leyfer, 2006).
• Higher rates (70%+) have been reported in clinical samples (Frazier, 2001; Lee & Ousley, 2006).
• 28–44% of adults diagnosed with ASD also meet criteria for ADHD (Lai 2014)

ASD in ADHD
• In a population-based twin sample of children, those with ADHD had elevated rates of autistic symptoms; 32% of boys and 75% of girls with ADHD, combined type met threshold for clinically significant autistic symptoms compared to normal controls (Reierson, 2007).
The impact of ASD and ADHD co-occurring

- Comorbid ASD + ADHD in children: higher scores for tantrums and irritable mood than ASD or ADHD (Goldin 2013, assessed comorbid psychiatric symptoms among 255 children with ASD, 40 with ADHD, and 47 with comorbid ADHD and ASD)

- Comorbid ASD + ADHD in children: higher rates of comorbid psychiatric symptoms, including temper tantrum, depressed mood, avoidance, and conduct behaviours, than those with ASD or ADHD alone (Jang 2013).

- Comorbidity interferes with:
  - psychopathology
  - interpersonal skills
  - School performance
  - Family relationships
  - cognitive domains
  (Rommelse 2010; Kotte 2013)

- Both conditions can have a large negative impact on the daily life of affected individuals and their families, in particular when both conditions co-occur (Anckarsäter 2006)
The links between ADHD and ASD

**cognitive functions** overlap between ASD and ADHD linked to a familial vulnerability for ASD and ADHD (intermediate phenotypes):
- executive functioning
- motor speed and variability
- emotion recognition
- detail-focused processing

Several recent large scale genome-wide studies have suggested that ASD and ADHD may share the same genetic susceptibility, which may explain this frequent comorbid phenomenon between ASD and ADHD (Ronald, Simonoff et al., 2008; Nijmeijer, Arias-Vasquez et al., 2010; Goldin, Matson et al., 2013)

Increasing interest in ADHD and ASD as common symptoms of the underlying developmental disorder (van der Meer et al. 2012; Gargaro et al. 2011; Grzadzinski et al. 2011; Hazell 2007; Lecavalier 2006; Sinzig et al. 2009).

ASD as well as ADHD are both highly heritable neurodevelopmental disorders about **70–80 % of the phenotypic variance of each disorder may be explained by genetic factors** (Faraone 2005; Freitag 2010; Lichtenstein 2010)

Family based studies showed **increased ASD symptoms in affected and non-affected siblings of ADHD patients** (Mulligan 2009).

Few studies in adults: show genetic **correlations between ASD and ADHD traits of 0.60** (Reierson 2008, Lundstrom 2011)
Pregnancy related risk factors

- Recent population-based studies reported increased rates of inattentive and ASD symptoms in 11 year old, previously preterm children below 26 weeks of pregnancy (Johnson et al. 2010)
- replicated for adults with ADHD (Halmoy et al. 2011).
- several pregnancy-related risk factors appear to increase the risk of ASD and combined ADHD diagnosis or symptoms:
  - valproic acid (Cohen et al. 2011; Rasalam et al. 2005)
  - maternal diabetes (Lyall et al. 2011; Nomura et al. 2012)
  - pre-eclampsia (Mann et al. 2010; Mann and McDermott 2011)
  - viral or bacterial infections (Atladottir et al. 2010a; Mann and McDermott 2011)
Most of these risk factors have been studied only recently, and are not well replicated
Comorbid ADHD and ASD presentation

ASD
- Social communication and interaction
- Need for sameness

ADHD
- Inattention
- Hyperactivity
- impulsivity

Overlap:
- poor social skills
- language delay
- sensory over-responsivity
- Attention problems
- oppositional defiant behaviour
- emotion regulation problems
Comorbid ADHD and ASD Assessment

- Clarification about what non-overlapping symptoms are present
- Could symptoms be masked by co-morbidity
  - eg ADHD symptoms may lead to better ratings on social interaction in children with ASD, partly because of the increased talkativeness seen with ADHD

- Use of informants
- Use of screening tools (Conners, Barkley, ASRS)
- Use of diagnostic tools (CAADID, DIVA)
- Consider neuropsychological assessment
- Consider if other co-morbidity present
<table>
<thead>
<tr>
<th>problem</th>
<th>More likely to be due to ASD</th>
<th>More likely to be due to ADHD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problems in conversation</td>
<td>Not getting social rules, lack of interest, monologues</td>
<td>Impulsive interrupting, zones out and misses part of conversation</td>
</tr>
<tr>
<td>overactive</td>
<td>Repetitive movements, flapping, pacing</td>
<td>Restless, fidgeting, makes excuses to get up</td>
</tr>
<tr>
<td>Constant use of computer games</td>
<td>Relates to circumscribed interests</td>
<td>Thrives of constant feedback, highly stimulating games</td>
</tr>
<tr>
<td>Few friends</td>
<td>Social awkwardness</td>
<td>Can make friends but can not keep them</td>
</tr>
<tr>
<td>anger</td>
<td>Changes to routines, anxiety</td>
<td>Emotional dysregulation, impulsivity, thrill seeking</td>
</tr>
</tbody>
</table>
Treatment

- **five-fold increase** between 2003-2010 in treatment of ADHD symptoms in ASD (Baribeau 2014)
- **¼ of children with ASD are prescribed stimulants** to treat symptoms of ADHD (Oswald & Sonenklar, 2007)
- methylphenidate is effective in treating ADHD in children with ASD (ES = 0.67):
  - lower than methylphenidate for ADHD symptoms in typically developing children with ADHD alone:
    - ES = .78; 95 % CI .64–.91; (Schachter et al. 2001)
    - ES = 1.03; (Faraone and Buitelaar 2010)
- significantly **greater risk of side effects** associated with methylphenidate use in children with ASD when compared to placebo. (Reichow 2013)
- Evidence supporting the efficacy of **clonidine and atomoxetine** in the treatment of ADHD symptoms in children with ASD relies on few double-blind RCTs (Reichow 2013)
Treatment in ID

Simonoff et al. (2013)

• RCT on the use of methylphenidate in 122 children with ADHD and comorbid intellectual disability (IQ 30-69)
• 58.5% of patients had a social communication impairment above a threshold for ASD (Social communication questionnaire score > 15)
• 32% patient sample had an IQ below 50.
• methylphenidate was superior to placebo on both Conners Parent and Teacher rating scales.
• 40% patients in the active treatment group were considered responders, vs. 7% of placebo participants.
• Neither IQ nor presence of symptoms of ASD moderated treatment response
• (did not include participants with normal IQ for comparison)
NICE Treatment Recommendations for Adults

• Drug treatment is the first-line treatment

• Methylphenidate (MPH) is the first line drug

• If MPH is ineffective or unacceptable then atomoxetine or dexamfetamine can be tried

• Where there is i) residual impairment, ii) no response, iii) medication is not an option or iv) the person chooses to avoid medication, then psychological therapy may be considered.

• Drug treatment should always form part of a comprehensive treatment programme that addresses psychological, behavioural and occupational needs
Pharmacological Treatment of ADHD

• **Stimulants:**
  - Methylphenidate (eg Ritalin, Concerta XL, Equasym XL, Medikinet XL)
  - Dexamfetamine sulfate, Lisdexamfetamine (Elvanse)

• **Non stimulants**
  - Atomoxetine
  - Bupropion
  - Modafinil
  - TCA
  - Venlafaxine
  - Clonidine/guafacine
Pharmacodynamics

**Methylphenidate** –
- Blocks reuptake of dopamine and noradrenaline by the dopamine and the noradrenaline transporters (DAT and NAT)
- Increases release of dopamine and noradrenaline

**Dexamfetamine** –
- Increases release of dopamine and noradrenaline
- Precise mechanisms unclear, important message is they have different mechanisms – patient may respond to once and not the other
- Act on both the prefrontal cortex and the subcortical striatum

**Atomoxetine** –
- Selective noradrenaline reuptake inhibitor in prefrontal cortex basal ganglia
- Effect on dopamine in the frontal cortex, as reuptake is by NAT
- Initiation of effect may take weeks, possibly up to 3 months.
Case study Mr A

- Mr A
- 59 year old divorced father of 2 grown up children
- Referred to adult ADHD service in 2011
- Seeing CMHT for depression and anxiety
- Long history of problems at school and then at work
- 11 year history of hoarding
- Hx of hypertension and hypercholesterolaemia
- Cousin with dyslexia, brother had severe disability secondary to perinatal asphyxiation
• ‘bubbly’ child
• Childhood overshadowed by brother’s disability
• Restless and inattentive in the classroom
• Studied Arabic at university
• Met his wife at university, 2 children now grown up, divorced
• Longest job 6 years
• Last worked as a computer technician in 2004
• School reports:
  - significant problems with focus and concentration
  - 'capacity to immerse himself totally in a subject that takes his interest’
  - 'disastrously idiosyncratic version of the English language’
CAADID diagnostic assessment completed
• 8/9 symptoms of inattention in childhood
• 6/9 symptoms of inattention in adulthood
• 9/9 symptoms of hyperactivity in childhood
• 9/9 symptoms of hyperactivity in adulthood
• Evidence of symptom onset from age 8
• Evidence of severe impairment
• collateral informant- school reports only
Diagnosis of ADHD confirmed

- Methylphenidate started
- Dose increase cautiously due to high BP
- Some impact on concentration and procrastination
- Disappointed that little impact on hoarding
• 2013 referred for autism spectrum disorder assessment
- hoarding
-severe anxiety in response to changes to benefits system in 2012 although this did not affect him directly
-social isolated: (embarrassment due to hoarding) + social awkwardness
-intense preoccupying interests throughout life
-he has taught himself eye contact from a book as an adult
ADOS-G completed

- Language and communication 2
- (autism cut off 3, ASD cut off 2)
- Reciprocal social interaction 9
- (autism cut off 6, ASD cut off 4)
- **Total score (communication and social) 11**
- (autism cut off 10, ASD cut off 7)
- Imagination and creativity 2
- Stereotyped behaviour and restricted interests 0
Diagnosis of Asperger’s Syndrome made
In addition to ADHD, anxiety and recurrent depression

Current treatment
- Concerta XL 54mg
- Management of anxiety
- BP monitoring
- Specialist CBT just started
In conclusion

• Significant comorbidity between ADHD and ASD
• Increasing interest in common aetiology
• Patients with one of both disorders should be routinely checked for the presence of the other disorder.
• Presence of comorbidity can affect assessment
• Treatments for ADHD should be used for ADHD + ASD
• Monitor side effects